

CLAIMS

What is claimed is:

1. An apparatus for discharging waste toner, comprising:
 - a housing temporarily storing waste toner separated from a surface of a photosensitive medium;
 - a waste toner discharge port formed at a bottom of the housing;
 - a shutter rotatably disposed at a side of the housing to open and cover the waste toner discharge port;
 - a pinion gear to rotate the shutter; and
 - a fixed gear, disposed on a frame to which the housing is mounted, engaging the pinion gear, the pinion gear rotating along the fixed gear when the housing is mounted to the frame, to rotate the shutter away from the waste toner discharge port.
2. The apparatus according to claim 1, wherein the shutter comprises a latch to hold the shutter in place when the shutter covers the waste toner discharge port.
3. The apparatus according to claim 2, wherein the waste toner discharge port has a projection to engage the latch.
4. The apparatus according to claim 1, wherein the fixed gear is a rack gear.
5. The apparatus according to claim 1, wherein the pinion gear is integrally formed with the shutter on an outer circumference of the shutter.
6. The apparatus according to claim 1, wherein the pinion gear engages the shutter on a side of the shutter.
7. The apparatus according to claim 1, further comprising a waste toner container formed under the waste toner discharge port to receive the waste toner discharged from the waste toner discharge port.
8. An apparatus for discharging waste toner comprising:
 - a housing storing waste toner separated from a photosensitive medium;

an auger disposed at a lower part inside the housing to gather the waste toner in a predetermined area;

an auger supporting member disposed at a side of the housing to rotatably support the auger;

a waste toner discharge port formed at a bottom of the auger supporting member, through which the waste toner gathered by the auger is discharged;

a shutter rotatably disposed at a side of the auger supporting member to open and close the waste toner discharge port;

a pinion gear to rotate the shutter; and

a fixed gear, disposed on a frame to which the housing is mounted, engaging the pinion gear, the pinion gear rotating along the fixed gear when the housing is mounted to the frame, to rotate the shutter to open the waste toner discharge port.

9. The apparatus according to claim 8, wherein the shutter comprises a latch to hold the shutter in place when the shutter covers the waste toner discharge port.

10. The apparatus according to claim 9, wherein the waste toner discharge port has a projection to engage the latch.

11. The apparatus according to claim 8, wherein the fixed gear is a rack gear.

12. The apparatus according to claim 8, wherein the pinion gear is integrally formed with the shutter on an outer circumference of the shutter.

13. The apparatus according to claim 8, wherein the pinion gear engages the shutter on a side of the shutter.

14. The apparatus according to claim 8, further comprising a waste toner container formed under the waste toner discharge port to receive the waste toner discharged from the waste toner discharge port.

15. An apparatus for discharging waste toner, comprising:

a housing detachably mounted to a frame and temporarily storing waste toner;

an auger;

an auger supporting member rotatably supporting the auger;
a waste toner discharge port in the auger supporting member, the auger rotating to gather waste toner and discharge the waste toner from the waste toner discharge port;
a shutter to open and cover the waste toner discharge part;
a pinion gear formed on a circumference of the shutter;
a fixed gear attached to the frame;
a latch on a side of the shutter; and
a projection on the auger supporting member adjacent to the waste toner discharge port, wherein when the housing is disassembled from the frame, the pinion gear rotates along the fixed gear in a first direction, which rotates the shutter to cover the waste toner discharge port, the latch engaging the projection to hold the shutter in place over the waste toner discharge port, and
wherein when the housing is mounted to the frame, the pinion gear rotates along the fixed gear in a direction opposite the first direction, which rotates the shutter and releases the latch from the projection to open the waste toner discharge port.

16. A method of disassembling and assembling an apparatus for discharging waste toner, the apparatus comprising a housing detachably mounted to a frame, an auger supporting member rotatably supporting an auger that rotates to gather waste toner for discharge through a waste toner discharge port, a shutter to open and close the waste toner discharge port, a pinion gear formed on a circumference of the shutter, a fixed gear attached to the frame, a latch on a side of the shutter, and a projection on the auger supporting member adjacent to the waste toner discharge port, the method comprising:

disassembling the housing from the frame by lifting the housing, said lifting the housing comprising rotating the pinion gear along the fixed gear in a first direction and rotating the shutter to cover the waste toner discharge port, engaging the latch with the projection to hold the shutter in place over the waste toner discharge port, and releasing the pinion gear from the fixed gear; and

assembling the housing to the frame by engaging the pinion gear with the fixed gear and lowering the housing, said lowering the housing comprising rotating the pinion gear along the fixed gear in a direction opposite the first direction and rotating the shutter to release the latch from the projection and open the waste toner discharge port.